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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/667,627	09/22/2003	Wen-Fei Yu	10541-1869	1188

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EXAMINER

WALBERG, TERESA J

ART UNIT PAPER NUMBER

3753

DATE MAILED: 07/13/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/667,627

Applicant(s)

YU ET AL

Examiner

Teresa J. Walberg

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 September 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_.
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: \_\_\_\_.

### DETAILED ACTION

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1-4, 6, and 9-13 are rejected under 35 U.S.C. 102(e) as being anticipated by Fang et al (2003/0209344).

Fang et al disclose (see para. 0031) a heat exchanger for cooling distinct fluids including an oil cooling section (para. 0031, line 17), first and second manifolds (22), a plurality of tubes (28) connected to the manifolds at each end and defining an oil flow passage, the tube being extruded metal (para. 0066, line 2) and including an outer wall and fins (para 0049, lines 9-10) extending into the oil flow passage, the tube including webs (para. 0051, lines 4-5) that divide the oil flow passage into multiple discrete flow paths, fins (34) interposed between adjacent tubes, another section of the exchanger being a condenser (para. 0031, lines 16-17), and the performance ratio of the tubes being between about 3.9 and 8.5 (para. 0009 teaches a hydraulic diameter of 0.55 to 2.5 mm, which would appear to equal a performance ratio of 1.6 to 7.27).

Note that the term “performance ratio” does not appear to be conventionally used in this technology. However, the formula applicants list for

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the "performance ratio" is mathematically related to the formula for "hydraulic diameter", which is conventionally used in this technology. Since the "performance ratio" (R) equals the wetted perimeter (P) divided by the cross sectional area (A), ( $R=P/A$ ), while the "hydraulic diameter" (D) equals four times the cross sectional area (A) divided by the wetted perimeter (P), ( $D=4A/P$ ), it would appear that the "performance ratio" equals four divided by the hydraulic diameter. If this is incorrect, the applicants are requested to provide clarification.

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 5 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fang et al (2003/0209344).

Fang et al disclose a heat exchanger as claimed with the exception of stating that the wetted perimeter is greater than 100 millimeters. However, it would have been obvious to use a wetted perimeter length of greater than 100 millimeters, or any other desired length, for the tubes in the heat exchanger of Fang et al based on the intended use and on the other proportions of the other heat exchanger.

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5. Claims 7, 8, 15, and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fang et al (2003/0209344) in view of Rhodes (6,213,158).

Fang et al disclose a heat exchanger as claimed with the exception of a formed metal sheet within the oil passage used as a turbulator. Rhodes teaches the use of formed metal sheets as turbulators in heat exchange passages. It would have been obvious in view of Rhodes to use a turbulator in the heat exchanger of Fang et al to increase turbulence and thus increase the heat transfer.

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Dudley and Varga are cited to show heat exchanger tube structure.

Bae et al, Ahn et al, Yu et al, Hu, (2004/0216863), Hu (2004/0261983), and Desai et al are cited to show heat exchanger tubes using a hydraulic diameter.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Teresa J. Walberg whose telephone number is 571-272-4790. The examiner can normally be reached on M-F 9:00 - 5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gene Mancene can be reached on 571-272-4930. The fax phone number

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for the organization where this application or proceeding is assigned is currently 703-872-9306. On July 15, 2005, the fax number will change to 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Teresa J. Walberg  
Primary Examiner  
Art Unit 3753

tjw